Appendix B

Space Flight Operations Contract

Payload Operations Support Team (POST)

Command and Data Tool (CDT)

Product Interface Definition Document (IDD)

Version 2.0

Contract NAS9-20000

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Chapter 1 - Introduction

1.1 Purpose

This document defines the product interface definitions for the Payload Operations Support Team (POST) Command and Data Tool (CDT) products intended for use with the Payload Integration Tool (PIT), the WinDecom Recon Tool (WRT) and the Workstation Reconfiguration System Command Server (WRS-CS).

1.2 Scope

This document defines the CDT convention for naming files, the content of the Java Archive (JAR) files, and the format and valid values of the data elements provided.

1.4 Reference Documents

Standard Integration Plan Annex No. 4 Command And Data Requirements	NSTS 21000 - A04
Space Shuttle General Purpose Computer (GPC) Payload Command Filter (GPCF) / Cargo Personal Computer (Cargo PC^{SM}) System Software Interface Requirements	NSTS 37331
POST Tools CDT Product Definition Document	TBD
Cargo PC System Software Development Spec.: Cargo PC System Software to Support Tools ICD	USA 001637

Chapter 2 – CDT Payload File Naming Conventions

2.1 File Naming Conventions

The CDT shall make all files for a single payload available in a signed JAR file. The convention for the JAR files is as follows:

- CDTnnn.jar

  Where the "nnn" is the 3-digit payload number

An internal RSA checksum will be used for the JAR file. A directory structure, or manifest file, within the JAR file shall match one of the following logical directory structures:

- For Production use: nnn/PRD/rrr/filename and
- For POST Field testing/development support: nnn/DEV/rrr/filename

  Where, again, the "nnn" is the 3-digit payload number, and the "rrr" is a 3-digit revision number incremented each time the products are created.

For the products generated for production, CDT shall make available a set of eight files for each payload. These payload-level files shall be in Extensible Markup Language (XML) 1.0 format. A Document Type Definition (DTD) file, which will not be in the JAR file, shall define each XML file type and control the content of the XML file (see Chapter 4 for a copy of the DTD files). The encoding character set for the XML files shall be UTF-8.

The CDT shall also make available three files for each payload application containing binary GPCF records.

For the products generated for field testing/development support, CDT shall make available one or more of the defined XML products within the JAR file and/or as separate files. The selection of GPCF Payload Application XML product creates a JAR file containing the XML file and the three binary files. For GPCF binary files format GPCF##nn, the '##' represents the payload application identifier and the 'nn' represents the version number.

FILENAME	CONTENT	PAYLOAD / PAYLOAD APPLICATION	ORDERED BY
PayloadDefinition.xml PayloadDefinition.dtd	Payload Definition	Payload	Payload
GPCFPayloadApplication.xml GPCFPayloadApplication.dtd	Command and Telemetry Lists for each Payload Application	Payload	Payload Application ID
ParameterDefinition.xml ParameterDefinition.dtd	Basic Parameter Definition Calibration Command FDA, FDA Precondition MDM Channelization	Payload	MSID

PDILoading.xml PDILoading.dtd	Telemetry Parameter Location Definitions	Payload	MSID
PLDataStreamStructure.xml PLDataStreamStructure.dtd	PDI and PL Independent Format Information Decom Words Downlink	Payload	Format ID
PSPSSI.xml PSPSSI.dtd	PSP Message SSI Definitions	Payload	N/A
HazardousCommandGroups.xml HazardousCommandGroups.dtd	Hazardous Command Groups	Payload	N/A
StandardOrbiterParameters.xml StandardOrbiterParameters.dtd	Standard Orbiter Parameters for WinDecom	Payload	N/A
GPCF##nn.PDM	GPCF PL Data Monitoring table	Payload Application	N/A
GPCF##nn.HTC	GPC-owned GPCF Command table	Payload Application	N/A
GPCF##nn.NHT	Non-GPC-owned GPCF Commands	Payload Application	N/A
ParameterValidation.xml ParameterValidation.dtd	List of Orbiter and Payload Defined Parameters	N/A	N/A

Chapter 3 - Data Format Conventions

3.1 Data Format Conventions

The format for the data elements (listed in the CDT Product Definitions Document) will be as follows:

- Flags shall have the value "Y" or "N", except for the following:
  - *analog_discrete_flag* shall have a value of either "A" for analog or "D" for discrete.
  - *pcmmu_ram_addr_lr_indic* shall have a value of either "L" for left or "R" for right.
  - *cmd_tlm_flag* shall have a value of either "C" for command or "T" for telemetry.
  - *audit_status_flag* shall have a value of either "P" for passed all audits, "W" for only audit warnings, or "E" audits had errors.
- Numbers are not required to have leading zeroes or blanks, except *sync_value* which have leading zeroes in order to derive the correct sync length.
- Numbers are decimal with the following exceptions which are in hexidecimal:
  - In GPCFPayloadApplication:
    - *command_data_word,*
    - *psp_tlm_sync_value,*
    - *reset_mask,*
    - *set_mask*
    - *transaction*
    - *sync_value*
  - In PLDataStreamStructure :
    - *mjr_frm_sync_value*
    - *mnr_frm_sync_value*
  - In PSPSSI:
    - *psp_tlm_sync_value*
  - In ParameterDefinition:
    - *command_data_word*
- The *sync_length* for the *mjr_frm_sync_value* and *mnr_frm_sync_value* shall be derived.
- Coefficients (A0-A5) shall be in the scientific notation format: ±n.nnnnnnnE±nn
- There shall be a blank space delimiting items in a list of values for the elements: *available_sample_rate, pdi_port_id_pseudo, pdi_port_id, decom_pair_number_of_words* and *decom_pair_start_word_number.*
- The order of *pdi_port_id_pseudo* shall exactly match the order of *pdi_port_id.* That is, the first entry in both elements shall be the first PDI port assignment for that telemetry format ID, etc.
- There shall be a unique MSID for each command and each telemetry parameter for FSW GPC process.
- The mnr_frm_sync _value is used for SYNC HEX VALUE for block sync value (mode 4).
- There will exist PSP_Config_Message_Item in the GPCFPayloadApplication.xml file for each PSP identifier for each payload application.
- Pseudo values shall be supplied for the elements:

- In GPCFPayloadApplication:
  - *btu_mia_address*
  - *pld_app_id,*
  - *psp_msg_id*
  - *psp_cmd_umb*
- In ParameterDefinition:
  - *btu_name*
  - *btu_mia_address*
  - *ssi_id_1*
  - *ssi_id_2*
  - *psp_msg_id*
  - *ssi_id*
  - *downlist_format_id*
- In PayloadDefinition:
  - *pld_app_id,*
- In PDILoading:
  - *format_id*
- In PLDataStreamStructure:
  - *format_id*
  - *pdi_port_id*
- In PSPSSI
  - *psp_msg_id*
  - *psp_cmd_umb*
  - *ssi_id*
  - *btu_name*

Chapter 4 –DTD Documents

4.1 PayloadDefinition.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ================================================================= -->
<!-- Payload Definition                                                -->
<!-- ================================================================= -->

<!ELEMENT Payload
(ContactInformation,pld_type,pld_nsts_pip_doc_number,pld_prime_msid_designator?,pld_ms
id_designator?,PayloadApplications)>
<!ATTLIST Payload
      generated_date_time_stamp CDATA #REQUIRED
      pld_config_name CDATA #REQUIRED
      pld_acronym CDATA #REQUIRED
      pld_number CDATA #REQUIRED
      audit_status_flag CDATA #IMPLIED
>
<!ELEMENT PayloadApplications (Application*)>
<!ELEMENT Application (#PCDATA)>
<!ATTLIST Application
      pld_app_id_pseudo CDATA #REQUIRED
      pld_app_id CDATA #REQUIRED
>
<!ELEMENT ContactInformation
(pld_customer_contact,pld_customer_phone_number,post_contact,post_phone_number)>
<!ELEMENT pld_customer_contact (#PCDATA)>
<!ELEMENT pld_customer_phone_number (#PCDATA)>
<!ELEMENT pld_nsts_pip_doc_number (#PCDATA)>
<!ELEMENT pld_prime_msid_designator (#PCDATA)>
<!ELEMENT pld_msid_designator (#PCDATA)>
<!ELEMENT pld_type (#PCDATA)>
<!ELEMENT post_contact (#PCDATA)>
<!ELEMENT post_phone_number (#PCDATA)>
```

4.2 ParameterDefinition.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ================================================================= -->
<!-- Parameter Definition                                              -->
<!-- ================================================================= -->

<!ELEMENT Payload (ParameterDefinition*)>
<!ATTLIST Payload
      generated_date_time_stamp CDATA #REQUIRED
      pld_config_name CDATA #REQUIRED
      pld_acronym CDATA #REQUIRED
      pld_number CDATA #REQUIRED
      audit_status_flag CDATA #IMPLIED
>
<!ELEMENT ParameterDefinition (BasicParameterDefinition,(Command|Telemetry),Derived?)>
<!ELEMENT BasicParameterDefinition
(cmd_tlm_flag,CustomerID?,CustomerOther?,NASA_ID?,const_dest_flag?,data_range_high,dat
a_range_low,data_range_units,Flight_Phases,gpcf_required_flag,gpcf_possible_flag,missi
on_indep_const?,pld_user_id?,ssi_io_reset_id?)>

<!ELEMENT Command
(command_type?,op_code?,command_destination?,command_measurement_indic?,command_measur
ement_type?,hzd_cmd_flag?,gnc_dataset_id?,index_dest_flag?,index_id?,interface_selecti
on?,mission_indep_std_gnc_dest_id?,pad_dest_flag?,pad_process_id?,pci_dest_flag?,pci_f
unction_selection?,psp_initialization_flag?,std_gnc_execution_rate?,(AnalogCommand|Dis
creteCommand|PSPCommand|SSICommand))>
<!ELEMENT AnalogCommand (Calibration,MDMChannelization,DSM?,rtc_type?)>
<!ELEMENT DiscreteCommand (reset_mask,set_mask,MDMChannelization,DSM?,rtc_type?)>
<!ELEMENT PSPCommand
(psp_msg_id_pseudo,psp_msg_id,no_of_command_data_words,command_data_word?)>
<!ELEMENT SSICommand
(ssi_id_pseudo,ssi_id,no_of_command_data_words,command_data_word,MDMChannelization)>

<!ELEMENT Telemetry
(data_type,source,tlm_dest_flag?,plm_dest_flag?,crt_dest_flag?,downlist_dest_flag?,Dow
nlist*,fda_dest_flag?,FDA?,sm_dest_flag?,gpc_acquisition_rate?,invert_meas_indic?,sm_c
onst_initial_value?,ssi_id_1_pseudo?,ssi_id_1?,ssi_id_2_pseudo?,ssi_id_2?,tlm_data_len
gth?,tlm_start_bit?,Calibration?,MDMChannelization?)>

<!ELEMENT CustomerID (cust_param_id, cust_param_desc)>
<!ELEMENT CustomerOther
(ms_bit_first_last_flag?,ms_byte_first_last_flag?,ind_fmt_start_bit?,cust_data_type?)>
<!ELEMENT NASA_ID
(basic_msid,nomenclature,field_test_msid?,parent_msid?,associated_msid?,keyboard_msid?
,wire_msid?)>

<!ELEMENT Calibration
(Coefficients,cal_curve_degree,cal_high_indep_var?,cal_low_indep_var?,cal_indep_var_un
its?)>
<!ELEMENT Coefficients
(a0_coefficient,a1_coefficient,a2_coefficient?,a3_coefficient?,a4_coefficient?,a5_coef
ficient?)>

<!ELEMENT FDA
(((Alert,precond_limit_sense_time_del?,FDAPreconditioning*),Critical?)|(Critical,(Aler
t,precond_limit_sense_time_del?,FDAPreconditioning*)?))>
<!ELEMENT Alert
(alert_class_indic,alert_fault_msg_disp_id,alert_fault_msg_mjr_txt,alert_fault_msg_mnr
_txt,alert_high_limit?,alert_low_limit?,alert_mjr_txt_disp_ref,alert_noise_filter,aler
t_number_of_limit_sets)>
<!ELEMENT Critical
(critical_fault_msg_disp_id,critical_fault_msg_mjr_txt,critical_fault_msg_mnr_txt,crit
ical_high_limit?,critical_low_limit?,critical_mjr_txt_disp_ref,critical_noise_filter)>
```

```
<!ELEMENT FDAPreconditioning
(precond_high_limit?,precond_low_limit?,limit_set_number,precond_left_paren_1?,precond
_left_paren_2?,precond_left_paren_3?,precond_logical_operator_1?,precond_logical_opera
tor_2?,precond_logical_operator_3?,precond_msid_1?,precond_msid_2?,precond_msid_3?,pre
cond_msid_4?,precond_req_state_msid_1?,precond_req_state_msid_2?,precond_req_state_msi
d_3?,precond_req_state_msid_4?,precond_right_paren_1?,precond_right_paren_2?,precond_r
ight_paren_3?)>

<!ELEMENT Downlist
(downlist_format_id,downlist_format_id_pseudo,downlist_homo_set_number?,downlist_low_b
it_rate_indic,downlist_number_of_sets?,req_response_rate)>
<!ELEMENT MDMChannelization
(btu_card_location,btu_card_type,btu_channel_number,btu_mia_address?,btu_mia_address_p
seudo?,btu_name,btu_name_pseudo,btu_no_words?,btu_number_bits?,btu_start_bit?,btu_word
_number?,flexmdm_pld_bus_no?)>
<!ELEMENT Flight_Phases
(flt_phase_entry_flag?,flt_phase_ascent_flag?,flt_phase_orbit_atch_flag?,flt_phase_orb
it_dtch_flag?,flt_phase_prelaunch_flag?)>
<!ELEMENT DSM (dsm_number,dsm_safing_flag,dsm_type,dsm_title?)>
<!ELEMENT Derived
(btu_rst_addr?,btu_set_addr?,c_w_flag?,concur_flag?,gpc_io_compute?,pld_mgt_use?,rf_up
link?,tlm_link_id?)>

<!ELEMENT a0_coefficient (#PCDATA)>
<!ELEMENT a1_coefficient (#PCDATA)>
<!ELEMENT a2_coefficient (#PCDATA)>
<!ELEMENT a3_coefficient (#PCDATA)>
<!ELEMENT a4_coefficient (#PCDATA)>
<!ELEMENT a5_coefficient (#PCDATA)>
<!ELEMENT alert_class_indic (#PCDATA)>
<!ELEMENT alert_fault_msg_disp_id (#PCDATA)>
<!ELEMENT alert_fault_msg_mjr_txt (#PCDATA)>
<!ELEMENT alert_fault_msg_mnr_txt (#PCDATA)>
<!ELEMENT alert_high_limit (#PCDATA)>
<!ELEMENT alert_low_limit (#PCDATA)>
<!ELEMENT alert_mjr_txt_disp_ref (#PCDATA)>
<!ELEMENT alert_noise_filter (#PCDATA)>
<!ELEMENT alert_number_of_limit_sets (#PCDATA)>
<!ELEMENT associated_msid (#PCDATA)>
<!ELEMENT basic_msid (#PCDATA)>
<!ELEMENT btu_card_location (#PCDATA)>
<!ELEMENT btu_card_type (#PCDATA)>
<!ELEMENT btu_channel_number (#PCDATA)>
<!ELEMENT btu_mia_address (#PCDATA)>
<!ELEMENT btu_mia_address_pseudo (#PCDATA)>
<!ELEMENT btu_name (#PCDATA)>
<!ELEMENT btu_name_pseudo (#PCDATA)>
<!ELEMENT btu_no_words (#PCDATA)>
<!ELEMENT btu_number_bits (#PCDATA)>
<!ELEMENT btu_rst_addr (#PCDATA)>
<!ELEMENT btu_set_addr (#PCDATA)>
<!ELEMENT btu_start_bit (#PCDATA)>
<!ELEMENT btu_word_number (#PCDATA)>
<!ELEMENT c_w_flag (#PCDATA)>
<!ELEMENT cal_curve_degree (#PCDATA)>
<!ELEMENT cal_high_indep_var (#PCDATA)>
<!ELEMENT cal_indep_var_units (#PCDATA)>
<!ELEMENT cal_low_indep_var (#PCDATA)>
<!ELEMENT cmd_tlm_flag (#PCDATA)>
<!ELEMENT command_data_word (#PCDATA)>
<!ELEMENT command_destination (#PCDATA)>
<!ELEMENT command_measurement_indic (#PCDATA)>
<!ELEMENT command_measurement_type (#PCDATA)>
<!ELEMENT command_type (#PCDATA)>
<!ELEMENT concur_flag (#PCDATA)>
<!ELEMENT const_dest_flag (#PCDATA)>
<!ELEMENT critical_fault_msg_disp_id (#PCDATA)>
```

```
<!ELEMENT critical_fault_msg_mjr_txt (#PCDATA)>
<!ELEMENT critical_fault_msg_mnr_txt (#PCDATA)>
<!ELEMENT critical_high_limit (#PCDATA)>
<!ELEMENT critical_low_limit (#PCDATA)>
<!ELEMENT critical_mjr_txt_disp_ref (#PCDATA)>
<!ELEMENT critical_noise_filter (#PCDATA)>
<!ELEMENT crt_dest_flag (#PCDATA)>
<!ELEMENT cust_data_type (#PCDATA)>
<!ELEMENT cust_param_desc (#PCDATA)>
<!ELEMENT cust_param_id (#PCDATA)>
<!ELEMENT data_range_high (#PCDATA)>
<!ELEMENT data_range_low (#PCDATA)>
<!ELEMENT data_range_units (#PCDATA)>
<!ELEMENT data_type (#PCDATA)>
<!ELEMENT downlist_dest_flag (#PCDATA)>
<!ELEMENT downlist_format_id (#PCDATA)>
<!ELEMENT downlist_format_id_pseudo (#PCDATA)>
<!ELEMENT downlist_homo_set_number (#PCDATA)>
<!ELEMENT downlist_low_bit_rate_indic (#PCDATA)>
<!ELEMENT downlist_number_of_sets (#PCDATA)>
<!ELEMENT dsm_number (#PCDATA)>
<!ELEMENT dsm_safing_flag (#PCDATA)>
<!ELEMENT dsm_type (#PCDATA)>
<!ELEMENT dsm_title (#PCDATA)>
<!ELEMENT fda_dest_flag (#PCDATA)>
<!ELEMENT field_test_msid (#PCDATA)>
<!ELEMENT flexmdm_pld_bus_no (#PCDATA)>
<!ELEMENT flt_phase_ascent_flag (#PCDATA)>
<!ELEMENT flt_phase_entry_flag (#PCDATA)>
<!ELEMENT flt_phase_orbit_atch_flag (#PCDATA)>
<!ELEMENT flt_phase_orbit_dtch_flag (#PCDATA)>
<!ELEMENT flt_phase_prelaunch_flag (#PCDATA)>
<!ELEMENT gnc_dataset_id (#PCDATA)>
<!ELEMENT gpc_acquisition_rate (#PCDATA)>
<!ELEMENT gpc_io_compute (#PCDATA)>
<!ELEMENT gpcf_required_flag (#PCDATA)>
<!ELEMENT gpcf_possible_flag (#PCDATA)>
<!ELEMENT hzd_cmd_flag (#PCDATA)>
<!ELEMENT ind_fmt_start_bit (#PCDATA)>
<!ELEMENT index_dest_flag (#PCDATA)>
<!ELEMENT index_id (#PCDATA)>
<!ELEMENT interface_selection (#PCDATA)>
<!ELEMENT invert_meas_indic (#PCDATA)>
<!ELEMENT keyboard_msid (#PCDATA)>
<!ELEMENT limit_set_number (#PCDATA)>
<!ELEMENT mission_indep_const (#PCDATA)>
<!ELEMENT mission_indep_std_gnc_dest_id (#PCDATA)>
<!ELEMENT ms_bit_first_last_flag (#PCDATA)>
<!ELEMENT ms_byte_first_last_flag (#PCDATA)>
<!ELEMENT no_of_command_data_words (#PCDATA)>
<!ELEMENT nomenclature (#PCDATA)>
<!ELEMENT op_code (#PCDATA)>
<!ELEMENT pad_dest_flag (#PCDATA)>
<!ELEMENT pad_process_id (#PCDATA)>
<!ELEMENT parent_msid (#PCDATA)>
<!ELEMENT pci_dest_flag (#PCDATA)>
<!ELEMENT pci_function_selection (#PCDATA)>
<!ELEMENT pld_mgt_use (#PCDATA)>
<!ELEMENT pld_user_id (#PCDATA)>
<!ELEMENT plm_dest_flag (#PCDATA)>
<!ELEMENT precond_high_limit (#PCDATA)>
<!ELEMENT precond_low_limit (#PCDATA)>
<!ELEMENT precond_left_paren_1 (#PCDATA)>
<!ELEMENT precond_left_paren_2 (#PCDATA)>
<!ELEMENT precond_left_paren_3 (#PCDATA)>
<!ELEMENT precond_limit_sense_time_del (#PCDATA)>
<!ELEMENT precond_logical_operator_1 (#PCDATA)>
```

```
<!ELEMENT precond_logical_operator_2 (#PCDATA)>
<!ELEMENT precond_logical_operator_3 (#PCDATA)>
<!ELEMENT precond_msid_1 (#PCDATA)>
<!ELEMENT precond_msid_2 (#PCDATA)>
<!ELEMENT precond_msid_3 (#PCDATA)>
<!ELEMENT precond_msid_4 (#PCDATA)>
<!ELEMENT precond_req_state_msid_1 (#PCDATA)>
<!ELEMENT precond_req_state_msid_2 (#PCDATA)>
<!ELEMENT precond_req_state_msid_3 (#PCDATA)>
<!ELEMENT precond_req_state_msid_4 (#PCDATA)>
<!ELEMENT precond_right_paren_1 (#PCDATA)>
<!ELEMENT precond_right_paren_2 (#PCDATA)>
<!ELEMENT precond_right_paren_3 (#PCDATA)>
<!ELEMENT psp_initialization_flag (#PCDATA)>
<!ELEMENT psp_msg_id_pseudo (#PCDATA)>
<!ELEMENT psp_msg_id (#PCDATA)>
<!ELEMENT req_response_rate (#PCDATA)>
<!ELEMENT reset_mask (#PCDATA)>
<!ELEMENT rf_uplink (#PCDATA)>
<!ELEMENT rtc_type (#PCDATA)>
<!ELEMENT set_mask (#PCDATA)>
<!ELEMENT sm_const_initial_value (#PCDATA)>
<!ELEMENT sm_dest_flag (#PCDATA)>
<!ELEMENT source (#PCDATA)>
<!ELEMENT ssi_id_pseudo (#PCDATA)>
<!ELEMENT ssi_id (#PCDATA)>
<!ELEMENT ssi_id_1 (#PCDATA)>
<!ELEMENT ssi_id_1_pseudo (#PCDATA)>
<!ELEMENT ssi_id_2 (#PCDATA)>
<!ELEMENT ssi_id_2_pseudo (#PCDATA)>
<!ELEMENT ssi_io_reset_id (#PCDATA)>
<!ELEMENT std_gnc_execution_rate (#PCDATA)>
<!ELEMENT tlm_data_length (#PCDATA)>
<!ELEMENT tlm_dest_flag (#PCDATA)>
<!ELEMENT tlm_link_id (#PCDATA)>
<!ELEMENT tlm_start_bit (#PCDATA)>
<!ELEMENT wire_msid (#PCDATA)>
```

4.3 PDILoading.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ============================================================= -->
<!-- PDI Loading                                                   -->
<!-- ============================================================= -->
<!ELEMENT Payload (CustomerFormatLoading*,PDILoading*)>
<!ATTLIST Payload
      generated_date_time_stamp CDATA #REQUIRED
      pld_config_name CDATA #REQUIRED
      pld_acronym CDATA #REQUIRED
      pld_number CDATA #REQUIRED
audit_status_flag CDATA #IMPLIED>
<!ELEMENT CustomerFormatLoading (CustomerTLMParameterLocationDefinition*)>
<!ATTLIST CustomerFormatLoading
      cust_param_id CDATA #IMPLIED
>
<!ELEMENT CustomerTLMParameterLocationDefinition
(format_name,fmt_start_bit,tlm_act_rate,tlm_first_frame,tlm_first_subframe?,tlm_first_
word,tlm_req_rate,tlm_data_length,start_sample,sample_increment,ms_bit_first_last_flag
,ms_byte_first_last_flag)>

<!ELEMENT PDILoading (TLMParameterLocationDefinition*)>

<!ATTLIST PDILoading
      basic_msid CDATA #REQUIRED
      field_test_msid CDATA #IMPLIED
      cust_param_id CDATA #IMPLIED
>

<!ELEMENT TLMParameterLocationDefinition
(format_id,format_id_pseudo,fmt_start_bit?,tlm_act_rate?,tlm_first_frame?,tlm_first_su
bframe?,tlm_first_word?,tlm_data_length?,tlm_req_rate?)>
<!ELEMENT format_name (#PCDATA)>
<!ELEMENT format_id (#PCDATA)>
<!ELEMENT format_id_pseudo (#PCDATA)>
<!ELEMENT fmt_start_bit (#PCDATA)>
<!ELEMENT ms_bit_first_last_flag (#PCDATA)>
<!ELEMENT ms_byte_first_last_flag (#PCDATA)>
<!ELEMENT start_sample (#PCDATA)>
<!ELEMENT sample_increment (#PCDATA)>
<!ELEMENT tlm_act_rate (#PCDATA)>
<!ELEMENT tlm_data_length (#PCDATA)>
<!ELEMENT tlm_first_frame (#PCDATA)>
<!ELEMENT tlm_first_subframe (#PCDATA)>
<!ELEMENT tlm_first_word (#PCDATA)>
<!ELEMENT tlm_req_rate (#PCDATA)>
```

4.4 PLDataStreamStructure.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ================================================================= -->
<!-- Payload Data Stream Structure                                     -->
<!-- ================================================================= -->

<!ELEMENT Payload
(CustomerPDIFormatDataStyles*,CustomerPDIFormat*,PLDataStreamStructure*)>
<!ATTLIST Payload
      generated_date_time_stamp CDATA #REQUIRED
      pld_config_name CDATA #REQUIRED
      pld_acronym CDATA #REQUIRED
      pld_number CDATA #REQUIRED
      audit_status_flag CDATA #IMPLIED
>
<!ELEMENT CustomerPDIFormatDataStyles
(bit_start_direction,bits_per_word,bits_start_at,words_start_at,frames_start_at,subfra
mes_start_at,ms_bit_first_last_flag,ms_byte_first_last_flag)>
<!ATTLIST CustomerPDIFormatDataStyles
      format_style CDATA #IMPLIED
>

<!ELEMENT CustomerPDIFormat
(format_desc,format_style,pdi_tlm_format_mode,pdi_tlm_data_code,pdi_tlm_bit_rate,minor
_frame_format_id?,CustomerPDIFrame+,NASAFormat?)>
<!ATTLIST CustomerPDIFormat
      format_name CDATA #IMPLIED
>

<!ELEMENT CustomerPDIFrame
(frame_size?,sync_value?,sync_loc_start_word?,sync_loc_start_bit?,sync_nbr_of_bits?,fc
_initial_value?,fc_last_value?,fc_start_word?,fc_start_bit?,fc_nbr_of_bits?,ms_bit_fir
st_last_flag?,ms_byte_first_last_flag?,frms_per_next_frame?,format_id_cust?)>
<!ATTLIST CustomerPDIFrame
      frame_level CDATA #IMPLIED
>

<!ELEMENT NASAFormat (#PCDATA)>
<!ATTLIST NASAFormat
      format_id CDATA #IMPLIED
      format_id_pseudo CDATA #REQUIRED
>

<!ELEMENT PLDataStreamStructure
(NASAFormat,Flight_Phases,available_sample_rate?,bit_rate_tol,bits_per_word?,data_cycl
e_period?,frms_per_mjr_frm?,mfc_initial_value?,mfc_start_word?,mfc_up_down_indic?,no_o
f_pdi_ports,pdi_port_id_pseudo,pdi_port_id,mjr_frm_period?,mjr_frm_sync_fl_indic?,mjr_
frm_sync_start_word?,mjr_frm_sync_value?,mnr_frm_sync_fl_indic?,mnr_frm_sync_start_wor
d?,mnr_frm_sync_value?,pdi_tlm_bandwidth?,pdi_tlm_bit_rate?,pdi_tlm_data_code?,pdi_tlm
_format_mode?,pld_dlnk_frame_size?,req_window_size?,sfc_initial_value?,sfc_start_word?
,sfc_up_down_indic?,subcom_depth?,tgl_buf_size?,words_per_frame_or_block?,Derived?,PDI
_Reconstructed?,BackupFormatList?,PrimaryFormat?,ReconstructedFormatList?)>
<!ELEMENT Flight_Phases
(flt_phase_ascent_flag?,flt_phase_entry_flag?,flt_phase_orbit_atch_flag?,flt_phase_orb
it_dtch_flag?,flt_phase_prelaunch_flag?)>

<!ELEMENT PrimaryFormat (#PCDATA)>
<!ATTLIST PrimaryFormat
      format_id CDATA #IMPLIED
      format_id_pseudo CDATA #REQUIRED
>

<!ELEMENT BackupFormatList (BackupFormat+)>
```

```
<!ELEMENT BackupFormat (#PCDATA)>
<!ATTLIST BackupFormat
      format_id CDATA #IMPLIED
      format_id_pseudo CDATA #REQUIRED
>

<!ELEMENT ReconstructedFormatList (ReconstructedFormat+)>
<!ELEMENT ReconstructedFormat (#PCDATA)>
<!ATTLIST ReconstructedFormat
      format_id CDATA #IMPLIED
      format_id_pseudo CDATA #REQUIRED
>

<!ELEMENT Derived (sync_type,sync_length?,tlm_format_indicator?)>
<!ELEMENT PDI_Reconstructed (Decom_Pair)>
<!ELEMENT Decom_Pair (decom_pair_number_of_words,decom_pair_start_word_number)>

<!ELEMENT available_sample_rate (#PCDATA)>
<!ELEMENT bit_start_direction (#PCDATA)>
<!ELEMENT bits_start_at (#PCDATA)>
<!ELEMENT bit_rate_tol (#PCDATA)>
<!ELEMENT bits_per_word (#PCDATA)>
<!ELEMENT data_cycle_period (#PCDATA)>
<!ELEMENT fc_initial_value (#PCDATA)>
<!ELEMENT fc_last_value (#PCDATA)>
<!ELEMENT fc_start_word (#PCDATA)>
<!ELEMENT fc_start_bit (#PCDATA)>
<!ELEMENT fc_nbr_of_bits (#PCDATA)>
<!ELEMENT flt_phase_ascent_flag (#PCDATA)>
<!ELEMENT flt_phase_entry_flag (#PCDATA)>
<!ELEMENT flt_phase_orbit_atch_flag (#PCDATA)>
<!ELEMENT flt_phase_orbit_dtch_flag (#PCDATA)>
<!ELEMENT flt_phase_prelaunch_flag (#PCDATA)>
<!ELEMENT format_desc (#PCDATA)>
<!ELEMENT format_id_cust (#PCDATA)>
<!ELEMENT format_style (#PCDATA)>
<!ELEMENT format_source (#PCDATA)>
<!ELEMENT frames_start_at (#PCDATA)>
<!ELEMENT frame_size (#PCDATA)>
<!ELEMENT frms_per_mjr_frm (#PCDATA)>
<!ELEMENT frms_per_next_frame (#PCDATA)>
<!ELEMENT mfc_initial_value (#PCDATA)>
<!ELEMENT mfc_start_word (#PCDATA)>
<!ELEMENT mfc_up_down_indic (#PCDATA)>
<!ELEMENT minor_frame_format_id (#PCDATA)>
<!ELEMENT mjr_frm_period (#PCDATA)>
<!ELEMENT mjr_frm_sync_fl_indic (#PCDATA)>
<!ELEMENT mjr_frm_sync_start_word (#PCDATA)>
<!ELEMENT mjr_frm_sync_value (#PCDATA)>
<!ELEMENT mnr_frm_sync_fl_indic (#PCDATA)>
<!ELEMENT mnr_frm_sync_start_word (#PCDATA)>
<!ELEMENT mnr_frm_sync_value (#PCDATA)>
<!ELEMENT ms_bit_first_last_flag (#PCDATA)>
<!ELEMENT ms_byte_first_last_flag (#PCDATA)>
<!ELEMENT no_of_pdi_ports (#PCDATA)>
<!ELEMENT pdi_port_id (#PCDATA)>
<!ELEMENT pdi_port_id_pseudo (#PCDATA)>
<!ELEMENT pdi_tlm_bandwidth (#PCDATA)>
<!ELEMENT pdi_tlm_bit_rate (#PCDATA)>
<!ELEMENT pdi_tlm_data_code (#PCDATA)>
<!ELEMENT pdi_tlm_format_mode (#PCDATA)>
<!ELEMENT pld_dlnk_frame_size (#PCDATA)>
<!ELEMENT req_window_size (#PCDATA)>
<!ELEMENT sfc_initial_value (#PCDATA)>
<!ELEMENT sfc_start_word (#PCDATA)>
<!ELEMENT sfc_up_down_indic (#PCDATA)>
<!ELEMENT subcom_depth (#PCDATA)>
```

```
<!ELEMENT subframes_start_at (#PCDATA)>
<!ELEMENT sync_length (#PCDATA)>
<!ELEMENT sync_loc_start_word (#PCDATA)>
<!ELEMENT sync_loc_start_bit (#PCDATA)>
<!ELEMENT sync_nbr_of_bits (#PCDATA)>
<!ELEMENT sync_type (#PCDATA)>
<!ELEMENT sync_value (#PCDATA)>
<!ELEMENT tgl_buf_size (#PCDATA)>
<!ELEMENT tlm_format_indicator (#PCDATA)>
<!ELEMENT words_per_frame_or_block (#PCDATA)>
<!ELEMENT words_start_at (#PCDATA)>
<!ELEMENT decom_pair_number_of_words (#PCDATA)>
<!ELEMENT decom_pair_start_word_number (#PCDATA)>
```

4.5 PSPSSI.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ================================================================= -->
<!-- PSP/SSP                                                           -->
<!-- ================================================================= -->

<!ELEMENT Payload (PSP_Message*,SSI_Definition*)?>
<!ATTLIST Payload
      generated_date_time_stamp CDATA #REQUIRED
      pld_config_name CDATA #REQUIRED
      pld_acronym CDATA #REQUIRED
      pld_number CDATA #REQUIRED
      audit_status_flag CDATA #IMPLIED
>
<!ELEMENT PSP_Message
(psp_msg_id,psp_msg_id_pseudo,psp_port_mode?,Command?,Telemetry?,Derived_PSP?)>
<!ELEMENT SSI_Definition
(ssi_id,ssi_id_pseudo,btu_bus_no,btu_name_pseudo,btu_name,ssi_input_chan_addr_1?,ssi_i
nput_chan_addr_2?,ssi_input_mod_addr_1?,ssi_input_mod_addr_2?,ssi_input_trans_word_cou
nt_1?,ssi_input_trans_word_count_2?,ssi_output_chan_addr?,ssi_output_mod_addr?,ssi_out
put_trans_word_count?,ssi_ssus_id?,Derived_SSI?)?>

<!ELEMENT Command
(psp_cmd_umb,psp_cmd_umb_pseudo,psp_cmd_data_code,psp_cmd_data_rate,psp_cmd_subcarrier
_idle)>
<!ELEMENT Telemetry
(psp_tlm_data_code,psp_tlm_frame_length,psp_tlm_rate,psp_tlm_sync_value)>
<!ELEMENT Derived_PSP (psp_sync_word_length)?>
<!ELEMENT Derived_SSI (ssi_channel_type?,ssi_transaction_type?)>

<!ELEMENT psp_cmd_umb (#PCDATA)>
<!ELEMENT psp_cmd_umb_pseudo (#PCDATA)>
<!ELEMENT psp_cmd_data_code (#PCDATA)>
<!ELEMENT psp_cmd_data_rate (#PCDATA)>
<!ELEMENT psp_cmd_subcarrier_idle (#PCDATA)>

<!ELEMENT psp_msg_id (#PCDATA)>
<!ELEMENT psp_msg_id_pseudo (#PCDATA)>
<!ELEMENT psp_port_mode (#PCDATA)>

<!ELEMENT psp_tlm_data_code (#PCDATA)>
<!ELEMENT psp_tlm_frame_length (#PCDATA)>
<!ELEMENT psp_tlm_rate (#PCDATA)>
<!ELEMENT psp_tlm_sync_value (#PCDATA)>
<!ELEMENT psp_sync_word_length (#PCDATA)>

<!ELEMENT btu_bus_no (#PCDATA)>
<!ELEMENT btu_name_pseudo (#PCDATA)>
<!ELEMENT btu_name (#PCDATA)>
<!ELEMENT ssi_id (#PCDATA)>
<!ELEMENT ssi_id_pseudo (#PCDATA)>
<!ELEMENT ssi_input_chan_addr_1 (#PCDATA)>
<!ELEMENT ssi_input_chan_addr_2 (#PCDATA)>
<!ELEMENT ssi_input_mod_addr_1 (#PCDATA)>
<!ELEMENT ssi_input_mod_addr_2 (#PCDATA)>
<!ELEMENT ssi_input_trans_word_count_1 (#PCDATA)>
<!ELEMENT ssi_input_trans_word_count_2 (#PCDATA)>
<!ELEMENT ssi_output_chan_addr (#PCDATA)>
<!ELEMENT ssi_output_mod_addr (#PCDATA)>
<!ELEMENT ssi_output_trans_word_count (#PCDATA)>
<!ELEMENT ssi_ssus_id (#PCDATA)>

<!ELEMENT ssi_channel_type (#PCDATA)>
<!ELEMENT ssi_transaction_type (#PCDATA)>
```

4.6 GPCFPayloadApplication.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ================================================================= -->
<!--   GPCFPayloadApplication.dtd                                      -->
<!-- ================================================================= -->

<!ELEMENT Payload (Application*)>
<!ATTLIST Payload
      generated_date_time_stamp CDATA #REQUIRED
      pld_config_name CDATA #REQUIRED
      pld_acronym CDATA #REQUIRED
      pld_number CDATA #REQUIRED
      audit_status_flag CDATA #IMPLIED
>
<!ELEMENT Application
(GPC_Owned_Commands,Payload_Data_Monitoring,PassThrough_Commands?)>
<!ATTLIST Application
      gpcf_table_version CDATA #REQUIRED
      registration_number CDATA #IMPLIED
      pld_app_id_pseudo CDATA #REQUIRED
      pld_app_id CDATA #REQUIRED
      pld_app_name CDATA #REQUIRED
      pld_app_desc CDATA #REQUIRED
>
<!ELEMENT GPC_Owned_Commands
(PSP_Config_Messages?,Commands,Display_Background_Update)?>
<!ELEMENT PSP_Config_Messages (PSP_Config_Message_Item*)>
<!ELEMENT PSP_Config_Message_Item
(psp_msg_id,psp_msg_id_pseudo,psp_cmd_data_rate,psp_cmd_data_code,psp_cmd_umb_pseudo,p
sp_cmd_umb,psp_cmd_subcarrier_idle,psp_port_mode,psp_tlm_rate,psp_tlm_data_code,psp_tl
m_frame_length,psp_tlm_sync_value,psp_tlm_sync_length,TransactionRecord)>
<!ELEMENT TransactionRecord
(GPCF_Key,opcode,transaction_id,first_last_indicator,item_update?,safe_arm_haz_cmd_id?
,Transaction?,CRC32?)>
<!ELEMENT GPCF_Key (pld_app_id,record_type,sequence_number)>
<!ELEMENT Transaction (#PCDATA)>
<!ELEMENT Commands
(PSP_Command_Table_Load,Serial_Command_Table_Load,Hazardous_Command_Table_Load,Analog_
Discrete_Command_Table_Load)>
<!ELEMENT PSP_Command_Table_Load (PSP_Command_Table_Load_Item*)>
<!ELEMENT PSP_Command_Table_Load_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,basic_msid,field_test_msid?,cust_param_id?,hzd_
cmd_flag?,psp_msg_id_pseudo,psp_msg_id,no_of_command_data_words,command_data_word,Tran
sactionRecord+)>
<!ELEMENT Serial_Command_Table_Load (Serial_Command_Table_Load_Item*)>
<!ELEMENT Serial_Command_Table_Load_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,basic_msid,field_test_msid?,cust_param_id?,hzd_
cmd_flag?,btu_mia_address_pseudo,btu_mia_address,btu_card_location,btu_channel_number,
no_of_command_data_words,command_data_word,TransactionRecord+)>
<!ELEMENT Hazardous_Command_Table_Load (Hazardous_Command_Table_Load_Item*)>
<!ELEMENT Hazardous_Command_Table_Load_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,basic_msid,field_test_msid?,cust_param_id?,hzd_
cmd_flag,psp_msg_id_pseudo,psp_msg_id,no_of_command_data_words,command_data_word,Trans
actionRecord+)>
<!ELEMENT Analog_Discrete_Command_Table_Load
(Analog_Discrete_Command_Table_Load_Item*)>
<!ELEMENT Analog_Discrete_Command_Table_Load_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,basic_msid,field_test_msid?,cust_param_id?,hzd_
cmd_flag?,analog_discrete_flag,analog_value?,btu_mia_address_pseudo,btu_mia_address,bt
u_card_location,btu_channel_number,reset_mask?,set_mask?,TransactionRecord)>
<!ELEMENT Display_Background_Update
(PayloadApp_Name_Transaction?,PayloadApp_Desc_Transaction?,Command_Numbers?,Payload_Da
ta_Monitor_Items?)>
```

```
<!ELEMENT PayloadApp_Name_Transaction (pld_app_id,pld_app_name,TransactionRecord)>
<!ELEMENT PayloadApp_Desc_Transaction (pld_app_id,pld_app_desc,TransactionRecord)>
<!ELEMENT Command_Numbers (Command_Number_Item+)>
<!ELEMENT Command_Number_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,TransactionRecord)>
<!ELEMENT Payload_Data_Monitor_Items (PldDataMonitor_Item+)>
<!ELEMENT PldDataMonitor_Item
(gpcf_pld_data_mon_item,gpcf_pld_data_mon_desc,TransactionRecord)>
<!ELEMENT Payload_Data_Monitoring
(Request_PL_Data_Monitoring_Entry,Display_Background_Update)?>
<!ELEMENT Request_PL_Data_Monitoring_Entry (Request_PL_Data_Monitoring_Entry_Item+)>
<!ELEMENT Request_PL_Data_Monitoring_Entry_Item
(gpcf_pld_data_mon_item,gpcf_pld_data_mon_desc,basic_msid,field_test_msid?,cust_param_
id?,pcmmu_ram_address?,pcmmu_ram_addr_lr_indic?,btu_mia_address_pseudo,btu_mia_address
,btu_card_location,btu_channel_number,btu_start_bit,tlm_start_bit,tlm_data_length,data
_type,gpcf_data_type,Calibration?,FDA,TransactionRecord)>
<!ELEMENT Calibration
(cal_curve_degree,a0_coefficient,a1_coefficient,a2_coefficient?,a3_coefficient?)>
<!ELEMENT FDA (Alert | Critical)>
<!ELEMENT Alert
(alert_class_indic,alert_high_limit?,alert_low_limit?,alert_noise_filter)>
<!ELEMENT Critical
(critical_alarm_class_indic,critical_high_limit?,critical_low_limit,critical_noise_fil
ter)>
<!ELEMENT PassThrough_Commands
(State_Vector_Attitude_Data_Transfer_PSP_PL?,OnDemand_Analog_Discrete_Command?,OnDeman
d_PSP_Command?,OnDemand_Serial_Command?,Safe_Arm_Hazardous_Command?,Confirm_Hazardous_
Command?,Table_Command_Execute?)>
<!ELEMENT State_Vector_Attitude_Data_Transfer_PSP_PL (StateVectorAttitude_Item+)?>
<!ELEMENT StateVectorAttitude_Item
(psp_msg_id_pseudo,psp_msg_id,psp_state_vector_flag?,psp_attitude_flag?,TransactionRec
ord)>
<!ELEMENT Confirm_Hazardous_Command (Confirm_Hazardous_Command_Item+)?>
<!ELEMENT Confirm_Hazardous_Command_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,basic_msid,field_test_msid?,cust_param_id?,hzd_
cmd_flag?,psp_msg_id_pseudo,psp_msg_id,no_of_command_data_words,command_data_word,Tran
sactionRecord+)>
<!ELEMENT OnDemand_Analog_Discrete_Command (OnDemand_Analog_Discrete_Command_Item+)?>
<!ELEMENT OnDemand_Analog_Discrete_Command_Item
(basic_msid,field_test_msid?,cust_param_id?,btu_mia_address_pseudo,btu_mia_address,btu
_card_location,btu_channel_number,reset_mask?,set_mask?,analog_discrete_flag,analog_va
lue?,TransactionRecord)>
<!ELEMENT OnDemand_PSP_Command (OnDemand_PSP_Command_Item+)?>
<!ELEMENT OnDemand_PSP_Command_Item
(psp_msg_id_pseudo,psp_msg_id,basic_msid,field_test_msid?,cust_param_id?,hzd_cmd_flag?
,no_of_command_data_words,command_data_word,TransactionRecord+)>
<!ELEMENT OnDemand_Serial_Command (OnDemand_Serial_Command_Item+)?>
<!ELEMENT OnDemand_Serial_Command_Item
(basic_msid,field_test_msid?,cust_param_id?,hzd_cmd_flag?,btu_mia_address_pseudo,btu_m
ia_address,btu_card_location,btu_channel_number,no_of_command_data_words,command_data_
word,TransactionRecord+)>
<!ELEMENT Safe_Arm_Hazardous_Command (Safe_Arm_Hazardous_Command_Item+)?>
<!ELEMENT Safe_Arm_Hazardous_Command_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,basic_msid,field_test_msid?,cust_param_id?,psp_
msg_id_pseudo,psp_msg_id,hzd_cmd_flag?,no_of_command_data_words,command_data_word,Tran
sactionRecord+)>
<!ELEMENT Table_Command_Execute (Table_Command_Execute_Item+)?>
<!ELEMENT Table_Command_Execute_Item
(gpcf_command_number,gpcf_cmd_nbr_desc,basic_msid,field_test_msid?,cust_param_id?,hzd_
cmd_flag?,TransactionRecord)>
<!ELEMENT a0_coefficient (#PCDATA)>
<!ELEMENT a1_coefficient (#PCDATA)>
<!ELEMENT a2_coefficient (#PCDATA)>
<!ELEMENT a3_coefficient (#PCDATA)>
<!ELEMENT alert_class_indic (#PCDATA)>
<!ELEMENT alert_high_limit (#PCDATA)>
<!ELEMENT alert_low_limit (#PCDATA)>
```

```
<!ELEMENT alert_noise_filter (#PCDATA)>
<!ELEMENT analog_discrete_flag (#PCDATA)>
<!ELEMENT analog_value (#PCDATA)>
<!ELEMENT basic_msid (#PCDATA)>
<!ELEMENT btu_card_location (#PCDATA)>
<!ELEMENT btu_channel_number (#PCDATA)>
<!ELEMENT btu_mia_address (#PCDATA)>
<!ELEMENT btu_mia_address_pseudo (#PCDATA)>
<!ELEMENT btu_start_bit (#PCDATA)>
<!ELEMENT cal_curve_degree (#PCDATA)>
<!ELEMENT cargo_pc_id (#PCDATA)>
<!ELEMENT cargo_pc_name (#PCDATA)>
<!ELEMENT command_data_word (#PCDATA)>
<!ELEMENT CRC32 (#PCDATA)>
<!ELEMENT critical_alarm_class_indic (#PCDATA)>
<!ELEMENT critical_high_limit (#PCDATA)>
<!ELEMENT critical_low_limit (#PCDATA)>
<!ELEMENT critical_noise_filter (#PCDATA)>
<!ELEMENT cust_param_id (#PCDATA)>
<!ELEMENT data_type (#PCDATA)>
<!ELEMENT first_last_indicator (#PCDATA)>
<!ELEMENT gpcf_cmd_nbr_desc (#PCDATA)>
<!ELEMENT gpcf_command_number (#PCDATA)>
<!ELEMENT gpcf_data_type (#PCDATA)>
<!ELEMENT gpcf_pld_data_mon_desc (#PCDATA)>
<!ELEMENT gpcf_pld_data_mon_item (#PCDATA)>
<!ELEMENT gpcf_table_version (#PCDATA)>
<!ELEMENT hzd_cmd_flag (#PCDATA)>
<!ELEMENT item_update (#PCDATA)>
<!ELEMENT no_of_command_data_words (#PCDATA)>
<!ELEMENT opcode (#PCDATA)>
<!ELEMENT field_test_msid (#PCDATA)>
<!ELEMENT pcmmu_ram_address (#PCDATA)>
<!ELEMENT pcmmu_ram_addr_lr_indic (#PCDATA)>
<!ELEMENT pld_app_desc (#PCDATA)>
<!ELEMENT pld_app_id (#PCDATA)>
<!ELEMENT pld_app_id_pseudo (#PCDATA)>
<!ELEMENT pld_app_name (#PCDATA)>
<!ELEMENT psp_attitude_flag (#PCDATA)>
<!ELEMENT psp_cmd_data_code (#PCDATA)>
<!ELEMENT psp_cmd_data_rate (#PCDATA)>
<!ELEMENT psp_cmd_subcarrier_idle (#PCDATA)>
<!ELEMENT psp_cmd_umb (#PCDATA)>
<!ELEMENT psp_cmd_umb_pseudo (#PCDATA)>
<!ELEMENT psp_msg_id (#PCDATA)>
<!ELEMENT psp_msg_id_pseudo (#PCDATA)>
<!ELEMENT psp_port_mode (#PCDATA)>
<!ELEMENT psp_state_vector_flag (#PCDATA)>
<!ELEMENT psp_tlm_data_code (#PCDATA)>
<!ELEMENT psp_tlm_frame_length (#PCDATA)>
<!ELEMENT psp_tlm_rate (#PCDATA)>
<!ELEMENT psp_tlm_sync_value (#PCDATA)>
<!ELEMENT psp_tlm_sync_length (#PCDATA)>
<!ELEMENT reset_mask (#PCDATA)>
<!ELEMENT record_type (#PCDATA)>
<!ELEMENT safe_arm_haz_cmd_id (#PCDATA)>
<!ELEMENT sequence_number (#PCDATA)>
<!ELEMENT set_mask (#PCDATA)>
<!ELEMENT transaction_id (#PCDATA)>
<!ELEMENT tlm_data_length (#PCDATA)>
<!ELEMENT tlm_start_bit (#PCDATA)>
```

4.7 HazardousCommandGroups.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ================================================================= -->
<!-- Hazardous Command Groups                                          -->
<!-- ================================================================= -->

<!ELEMENT Payload (HazardousCommandGroups)?>
<!ATTLIST Payload
   generated_date_time_stamp CDATA #REQUIRED
   pld_config_name CDATA #REQUIRED
   pld_acronym CDATA #REQUIRED
   pld_number CDATA #REQUIRED
   audit_status_flag CDATA #IMPLIED
>
<!ELEMENT HazardousCommandGroups (HazardousCommand*)>
<!ELEMENT
HazardousCommand(cmdhzd_group_id,cmdhzd_group_name,cmdhzd_group_mask,cmdhzd_command
_data_words)>

<!ELEMENT cmdhzd_group_id (#PCDATA)>
<!ELEMENT cmdhzd_group_name (#PCDATA)>
<!ELEMENT cmdhzd_group_mask (#PCDATA)>
<!ELEMENT cmdhzd_command_data_words(#PCDATA)>
```

4.8 StandardOrbiterParameters.dtd

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- ================================================================= -->
<!-- Standard Orbiter Parameters                                       -->
<!-- ================================================================= -->

<!ELEMENT Payload (OrbiterParameters)?>
<!ATTLIST Payload
   generated_date_time_stamp CDATA #REQUIRED
   pld_config_name CDATA #REQUIRED
   pld_acronym CDATA #REQUIRED
   pld_number CDATA #REQUIRED
   audit_status_flag CDATA #IMPLIED
>
<!ELEMENT OrbiterParameters (Parameter*)>
<!ELEMENT Parameter (#PCDATA)>
<!ATTLIST Parameter
   basic_msid CDATA #REQUIRED
   nomenclature CDATA #IMPLIED
>
```

4.9 ParameterValidation.dtd

TBD